Name ______________________________ Date ______________

LESSON 12.3

Practice C

For use with pages 810–817

Tell whether the sequence is geometric. *Explain* why or why not.

1. $0.8, 1, 8, 64, \ldots$
2. $\frac{3}{28}, \frac{3}{7}, \frac{12}{7}, \frac{48}{7}, \ldots$
3. $31, 213, 4459, 637, 91, \ldots$

Write a rule for the *n*th term of the geometric sequence. Then find a_6.

4. $13, 104, 832, 6656, \ldots$
5. $3.125, 10, 32, 102.4, \ldots$
6. $-43.2, -36, -30, -25, \ldots$
7. $35, -7, \frac{7}{5}, -\frac{7}{25}, \ldots$
8. $2808, 468, 78, 13, \ldots$
9. $-\frac{34}{3}, \frac{68}{9}, -\frac{136}{27}, \frac{272}{81}, \ldots$

Write a rule for the *n*th term of the geometric sequence. Then find a_5.

10. $a_1 = 17, r = -2$
11. $a_4 = -3, r = -2$
12. $a_3 = -144, r = 0.5$
13. $a_4 = \frac{1}{27}, r = \frac{4}{3}$
14. $a_4 = \frac{189}{1000}, r = \frac{3}{5}$
15. $a_3 = -28, r = \frac{7}{3}$

Write a rule for the *n*th term of the geometric sequence that has the two given terms.

16. $a_2 = 36, a_4 = 576$
17. $a_2 = -153, a_4 = -17$
18. $a_4 = 351, a_7 = 13$
19. $a_3 = 5, a_6 = 5000$
20. $a_2 = 4, a_5 = \frac{256}{27}$
21. $a_2 = \frac{32}{9}, a_7 = -27$

Find the sum of the geometric series.

22. $\sum_{i=1}^{5} 17(2)^{i-1}$
23. $\sum_{i=1}^{7} 3(-4)^{i-1}$
24. $\sum_{i=0}^{4} 3(-2)^{i}$
25. $\sum_{i=1}^{7} 81\left(\frac{1}{3}\right)^{i-1}$
26. $\sum_{i=0}^{5} 256\left(\frac{5}{4}\right)^{i}$
27. $\sum_{i=1}^{6} 25\left(-\frac{9}{5}\right)^{i-1}$

28. **Savings Account** You open a savings account with \$500. The account pays 2.2% interest per year, compounded annually. You do not make any withdrawals from or deposits into the account. Write a rule for the amount in the account after *n* years. Then find the amount in the account after 10 years.

29. **Bouncing Ball** You drop a ball from a height of 66 inches and the ball starts bouncing. After each bounce, the ball reaches a height that is 80% of the previous height. Write a rule for the height of the ball after the *n*th bounce. Then find the height of the ball after the sixth bounce.

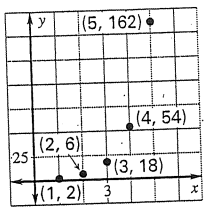
30. **Pendulum** A pendulum is released. It swings forward, traveling a distance of 120 centimeters. On each successive swing, the pendulum travels 97% of the distance of the previous swing. Find the total distance traveled by the pendulum in the first 12 swings.

Lesson 12.3, continued

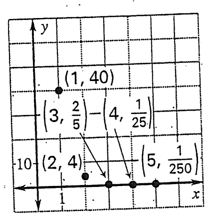
Practice Level B

1. no; The ratios are different. **2.** yes; Each ratio is $\frac{2}{1}$. **3.** yes; Each ratio is $\frac{1}{2}$. **4.** no; The ratios are different. **5.** yes; Each ratio is $\frac{3}{1}$. **6.** yes; Each ratio is $\frac{1}{3}$.

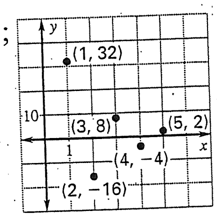
7. $a_n = 2(3)^{n-1}$; 486;



8. $a_n = 40\left(\frac{1}{10}\right)^{n-1}$; $\frac{1}{2500}$;



9. $a_n = 32\left(-\frac{1}{2}\right)^{n-1}$; -1;



10. $a_n = 1(3)^{n-1}$ **11.** $a_n = 6(2)^{n-1}$

12. $a_n = \frac{1}{2}(4)^{n-1}$ **13.** $a_n = 4\left(\frac{1}{2}\right)^{n-1}$

14. $a_n = 400\left(-\frac{1}{4}\right)^{n-1}$ **15.** $a_n = -3\left(\frac{2}{3}\right)^{n-1}$

16. 93 **17.** $\frac{32{,}800}{243}$ **18.** $\frac{1023}{16}$ **19.** 236,192

20. $\frac{6305}{96}$ **21.** $\frac{255{,}875}{64}$

22. $a_n = 20{,}000(1.12)^{n-1}$; \$172,255.23

Practice Level C

1. no; Ratios are not constant. **2.** yes; Each ratio is 4. **3.** yes; Each ratio is $\frac{1}{7}$. **4.** $a_n = 13(8)^{n-1}$; 425,984 **5.** $a_n = 3.125(3.2)^{n-1}$; 1048.576

6. $a_n = -43.2\left(\frac{5}{6}\right)^{n-1}$; $-\frac{625}{36}$

7. $a_n = 35\left(-\frac{1}{5}\right)^{n-1}$; $-\frac{7}{625}$

8. $a_n = 2808\left(\frac{1}{6}\right)^{n-1}$; $\frac{13}{36}$

9. $a_n = -\frac{34}{3}\left(-\frac{2}{3}\right)^{n-1}$; $\frac{1088}{729}$

10. $a_n = 17(-2)^{n-1}$; 272

11. $a_n = \frac{3}{8}(-2)^{n-1}$; 6

12. $a_n = -576(0.5)^{n-1}$; -36

13. $a_n = \frac{1}{64}\left(\frac{4}{3}\right)^{n-1}$; $\frac{4}{81}$ **14.** $a_n = \frac{7}{8}\left(\frac{3}{5}\right)^{n-1}$; $\frac{567}{5000}$

15. $a_n = -\frac{36}{7}\left(\frac{7}{3}\right)^{n-1}$; $-\frac{1372}{9}$

16. $a_n = 9(4)^{n-1}$ **17.** $a_n = -459\left(\frac{1}{3}\right)^{n-1}$

18. $a_n = 9477\left(\frac{1}{3}\right)^{n-1}$ **19.** $a_n = \frac{1}{20}(10)^{n-1}$

20. $a_n = 3\left(\frac{4}{3}\right)^{n-1}$ **21.** $a_n = -\frac{64}{27}\left(-\frac{3}{2}\right)^{n-1}$

22. 527 **23.** 9831 **24.** 33 **25.** $\frac{1093}{9}$

26. 2882.25 **27.** -294.752

28. $a_n = 500(1.022)^n$; \$621.55

29. $a_n = 66(0.8)^n$; about 17.3 in.

30. about 1224.6 in.

Study Guide

1. yes **2.** yes **3.** no **4.** yes **5.** $a_n = 6^{n-1}$

6. $a_n = 7(2)^{n-1}$ **7.** $a_n = \frac{1}{2}\left(\frac{1}{2}\right)^{n-1}$

8. $a_n = 2(-3)^{n-1}$ **9.** 11,184,810 **10.** 2,015,539

11. $\frac{315}{16}$

Problem Solving Workshop: Mixed Problem Solving

1. a. $a_n = 28{,}000(0.85)^n$ **b.** about \$7629.73

2. a. $a_n = 4n + 8$ **b.** 8th row **c.** 828 **d.** 564

3. a. $a_n = 35{,}000(1.028)^{n-1}$ **b.** \$38,023.09 **c.** \$491,114.73 **4.** 20 **5.** $a_n = 4n + 3$; 35 in.; To find the height of the bottom of the nth row of bricks, change the rule to $a_n = 4(n - 1) + 3$.

6. Answers will vary. **7.** 126 in.^{2}

8. a. geometric; Each term decreases by a factor of $\frac{1}{2}$. **b.** $a_n = 75\left(\frac{1}{2}\right)^{n-1}$